DOCUMENT RESUME

ED 397 282 CE 072 167

TITLE	Mississippi Curriculum Framework for Forestry (Program CIP: 03.0401--Forest Harvesting and Production Technology). Secondary Programs.
INSTITUTION	Mississippi Research and Curriculum Unit for Vocational and Technical Education, State College.
SPONS AGENCY	Mississippi State Dept. of Education, Jackson. Office of Vocational and Technical Education.
PUB DATE	30 Jul 96
NOTE	83p.; For related documents, see CE 072 162-231.
PUB TYPE	Guides - Classroom Use - Teaching Guides (For Teacher) (052)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Academic Education; *Agricultural Education; Agronomy; Behavioral Objectives; Careers; Classroom Techniques; Competence; *Competency Based Education; Core Curriculum; Educational Equipment; Employment Qualifications; *Forestry; Forestry Occupations; *Land Use; Leadership; *Lumber Industry; Secondary Education; State Curriculum Guides; Statewide Planning; Student Evaluation; Trees; Vocational Education
IDENTIFIERS	Future Farmers of America; Mississippi

ABSTRACT

This document, which reflects Mississippi's statutory requirement that instructional programs be based on core curricula and performance-based assessment, contains outlines of the instructional units required in local instructional management plans and daily lesson plans for forestry I and II. Presented first are a program description and course outlines. Section I contains curriculum frameworks for both courses, and section II contains outlines of the instructional units required in each course. Units in forestry I are as follows: exploring the world of forestry, leadership/Future Farmers of America (FFA) activities, forest safety, tree growth and stand development, dendrology, forest surveying and mapping, legal land description, tree and log measurements, and introduction to timber cruising. Units in forestry II include the following: identify forests and forest products, employability skills/FFA activities, forest management practices, advanced timber cruising, timber marketing, timber harvesting, reforestation, forest fire management, and forest insects and disease. A list is provided of recommended tools and equipment for a class of 20 students. Each unit includes suggested time on tasks, competencies and objectives, teaching strategies, assessment strategies, and resources. Recommended tools and equipment are listed in section III. Appended are lists of related academic topics and workplace skills for the 21st century and student competency profiles for both courses. (YLB)

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ED 397 282

Mississippi Curriculum Framework for Forestry

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Secondary
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1996

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CURRICULUM FRAMEWORK

FOR

FORESTRY

(PROGRAM CIP: 03.0401 - Forest Harvesting and Production Technology)

SECONDARY PROGRAMS

1996

July 30, 1996

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Published by the:

Office of Vocational and Technical Education
Mississippi Department of Education
Jackson, Mississippi

Research and Curriculum Unit for Vocational and Technical Education
College of Education
Mississippi State University
Mississippi State, Mississippi

1996

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FOREWORD

The courses in this document reflect the following statutory requirements as found in Section 37-3-49, Mississippi Code of 1972, as amended:

> The State Department of Education shall provide an instructional program and establish guidelines and procedures for managing such programs in the public schools as part of the State Program of Educational Accountability and Assessment of Performance. . .
>
> The department shall provide that such program or guidelines . . . are enforced through the performance-based accreditation system.
>
> The local school board must adopt the objectives that will form the core curriculum that will be systematically delivered throughout the district.
>
> Standards for student performance must be established for each core objective in the local program and those standards establish the district's definition of mastery for each objective.
>
> There shall be an annual review of student performance in the instructional program against locally established standards.

Each secondary vocational-technical course consists of a series of instructional units which focus on a common theme. All units have been written using a common format which includes the following components:

- Unit Number and Title
- Suggested Time on Task - The number of days of instruction that should be required to teach the competencies and objectives of the unit. For secondary occupational programs, a "day" represents a two-period block of instruction.
- Competencies and Suggested Objectives
  - A **Competency** represents a general concept of performance that students are expected to master as a requirement for satisfactorily completing a unit. Students will be expected to master all competencies in the curriculum framework in order to satisfactorily complete the course.
  - The **Suggested Objectives** represent the enabling and supporting knowledge and performances that will indicate mastery of the competency.
- Suggested Teaching Strategies - This section of each unit indicates strategies that can be used to enable students to master each suggested objective. Teachers should feel free to modify or enhance these suggestions based on needs of their students and resources available in order to provide optimum learning experiences for their students.

- Suggested Assessment Strategies - This section indicates strategies that can be used to measure student mastery. Examples of suggested strategies could include classroom discussions, laboratory exercises, and student assignments. Again, teachers should feel free to modify or enhance these suggested assessment strategies based on local needs and resources.
- Suggested Resources - This section indicates some of the primary instructional resources that may be used to teach the competencies and suggested objectives. Again, these resources are suggested and the list may be modified or enhanced based on needs and abilities of students and on available resources.

The following guidelines were used in developing the curriculum framework in this document and should be considered in developing local instructional management plans and daily lesson plans:

- The content of the courses in this document reflects approximately 75 percent of the time allocated to each course. For a one-year course, this means that the content of the existing units of instruction should represent approximately 135 days of instruction. The remaining 25 percent of each course should be developed at the local district level and may reflect:
  - Additional units of instruction within the course related to topics not found in the state framework.
  - Activities which develop a higher level of mastery on the existing competencies and suggested objectives.
  - Activities and instruction related to new technologies and concepts that were not prevalent at the time the current framework was developed/revised.
  - Activities which implement components of the Mississippi Tech Prep Initiative, including integration of academic and vocational-technical skills and coursework, school-to-career transition activities, and articulation of secondary and postsecondary vocational-technical programs.
  - Individualized learning activities, including work site learning activities, to better prepare individuals in the courses for their chosen occupational area.
- Sequencing of the units of instruction within a course is left to the discretion of the local district. Naturally, foundation units related to topics such as safety, tool and equipment usage, and other fundamental skills should be taught first. Other units related to specific skill areas in the course, however, may be sequenced to take advantage of seasonal and climatic conditions, resources located outside of the school, and other factors.

ACKNOWLEDGEMENTS

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PROGRAM DESCRIPTION

FORESTRY

(Program CIP: 03.0401 – Forest Harvesting and Production Technology)

Forestry is an instructional program designed to prepare students to enter occupations related to the field of forestry. Graduates may become employed at the entry level or pursue careers in Forestry, Agriculture, Agribusiness, or Natural Resources Education in postsecondary or higher education. These concepts are taught through applications such as the Supervised Agricultural Experience Program (SAE) and FFA Contests and Proficiency Awards Programs. This program relies upon computer simulations utilizing the Agricultural Satellite Information Service (ASIS). The FFA is an intra-curricular vocational student organization designed to provide a learning laboratory for the implementation of this curriculum. Graduates may become employed at the entry level or pursue careers in Agriculture, Agribusiness, or Natural Resources Education in postsecondary or higher education.

COURSE OUTLINE

FORESTRY I

Unit No.	Unit Name	Days
Unit 1	Exploring the World of Forestry	4
Unit 2	Leadership/FFA Activities	4
Unit 3	Forest Safety	4
Unit 4	Tree Growth and Stand Development	4
Unit 5	Dendrology	20
Unit 6	Forest Surveying and Mapping	25
Unit 7	Legal Land Descriptions	20
Unit 8	Tree and Log Measurements	25
Unit 9	Introduction to Timber Cruising	29

FORESTRY II

Unit No.	Unit Name	Days
Unit 1	Identify Forests and Forest Products	4
Unit 2	Employability Skills/FFA Activities	4
Unit 3	Forest Management Practices	29
Unit 4	Advanced Timber Cruising	34
Unit 5	Timber Marketing	12
Unit 6	Timber Harvesting	12
Unit 7	Reforestation	14
Unit 8	Forest Fire	14
Unit 9	Forest Insects and Disease	12

SECTION I:

CURRICULUM FRAMEWORK

FOR

FORESTRY

CURRICULUM FRAMEWORK

Course Name: Forestry I

Course CIP Code: 03.0401

Course Description: Forestry I is an instructional program that orients an individual to forestry occupations. Study in this course allows an individual to prepare for employment or continued education in the occupation of forestry. The units of study are: Explore the World of Forestry, Leadership/FFA Activities, Forest Safety, Tree Growth and Stand Development, Dendrology, Forest Surveying and Mapping, Legal Land Descriptions, Tree and Log Measurements, and Introduction to Timber Cruising. (2-2½ Carnegie Units, depending upon time spent in the course)

Competencies and Suggested Objectives:

1. Explain the importance of forestry.
   a. Describe the elements of a forest community, including trees, plants, shrubs, soil, water, and animal life.
   b. Describe the importance of trees and forests, including products, employment, climate, air quality, erosion, and recreation.
   c. Describe the amount of forested land worldwide and in the United States, including acres of forest land and acres of commercial land within the local county or regional area.
   d. Describe the history of forestry, including the importance of forestry to the South and to Mississippi.
   e. Describe the importance of forests in the South, including growing season, timber inventory, and economic impact.
   f. Describe resources considered in multiple-use forest management, including timber, soil, wildlife, recreation, and water.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S2, S4
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6
2. Explain careers in the field of forestry.
   a. Identify the careers available in the field of forestry, including educational requirements, job opportunities, duties, and responsibilities for professional, technical, and forestry workers.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6
3. Explain the impact of federal and state regulations on forestry operations.
   a. Describe the federal regulations impacting forest operations.
   b. Describe the state regulations impacting forest operations.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S2, S4
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6

4. Explain the benefits of FFA participation.
   a. Identify FFA organizational activities that promote and recognize achievements in forestry, including career development events, personal development seminars, leadership conferences, national and international exchange programs, education experience with industry, and personal and community development programs.
   b. Identify the benefits of FFA participation to an individual and to the forestry industry, including personal growth and development, exposure to the forestry industry environment, and multicultural experiences.
   c. Identify opportunities for members in the FFA organization, including personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6
5. Demonstrate group leadership skills.
   a. Develop and present a 3-5 minute speech on a forestry topic, including guidelines for preparing a successful speech, speech outlining, resource development, writing skills, and presentation skills.
   b. Describe the purposes and functions of parliamentary procedure, including the ability to conduct a meeting, methods of voting, motions and their handling, and officer positions and functions.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6
6. Explain forest safety practices.
   a. Describe environmental hazards, including heat, cold, insects, wildlife, and topographical hazards.
   b. Describe first aid and first aid equipment used in forestry work.
   c. Describe job site safety practices, including the hazards, carelessness, safety equipment, safety regulations, and prevention of accidents.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S8
   Workplace Skills (See Appendix B): WP1, WP6
7. Explain tree physiology.
   a. Describe the main parts of a tree, including trunk, crown, and roots along with their functions.
   b. Describe tree respiration and photosynthesis, including respiration, transfer of water, minerals, nutrients, and production of food.
   c. Describe environmental and biological factors that affect tree growth, including temperature, moisture, light, air, soil, tolerance, and hardiness.
   d. Describe the methods of tree reproduction, including sprouts, seeds, and suckers.
   e. Identify characteristics of tree growth, including height and diameter growth.

Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S2, S4
Workplace Skills (See Appendix B): WP2, WP6

7. Explain forest stand development.
   a. Identify stands according to classifications, including age, size, and composition.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S2, S8
   Workplace Skills (See Appendix B): WP2, WP6
8. Explain applications of tissue culture, cloning, and other advances in biotechnology to forestry.
   a. Describe applications of tissue culture, cloning, and other advances in biotechnology to forestry.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP4, WP6
9. Explain the tree classification system.
   a. Identify nomenclature and taxonomy terms, including common name and binomial name.
   b. Describe identifying characteristics of trees, including fruit, leaves, twigs, bark, and tree form.
   c. Describe the economic importance of species of trees, including the uses made of wood products from each species.
   d. Collect leaves and bark samples of commercially valuable species found locally.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S2, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6
10. Explain concepts of forest surveying.
   a. Define terms, including bearings, azimuths, chaining, boundary lines, angles, surveying, and traversing.
   b. Describe the importance of surveying to forestry, including timber sales, land measurement, boundary marking, and mapping.
   c. Identify characteristics of a forest survey, including use of compass, measuring distances, and mapping.
   d. Identify surveying tools, including compass, chain, plumb bob, and range pole.
   e. Label parts of a compass, including magnetic needle, pivot point, housing graduated in degrees, and sighting mirror.
   f. Identify compass measurements and symbols, including azimuths, bearings, degrees, minutes, and seconds.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6
11. Perform forestry surveying and mapping techniques.
   a. Determine the number of paces per chain using common pacing techniques.
   b. Perform compass, pacing, and chaining skills, including completing a traverse of a selected area.

c. Utilize new technologies for forest surveying and mapping, including satellite imaging and global positioning system.

Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S2, S4
Workplace Skills (See Appendix B): WP2, WP6

12. Explain the legal land description system used in Mississippi.
    a. Define legal land description terms, including bearing, blaze, contour, elevation, legend, plot, sea level, and topographic map.
    b. Describe reasons for land location in forestry, including retrace, location, and layout of boundaries.
    c. Distinguish among types of legal land descriptions, including United States Public Land Survey System (USPLSS), lot and block system, Vara, and metes and bounds.
    d. Describe the United States Public Land Survey System, including baseline, meridians, parallels, initial point, townships, and range lines.
    e. Identify the principal meridians, baselines, and initial points in Mississippi, including location of these lines on a map.
    f. Describe information found in a map legend, including direction, land, water, structures, and scale.
    g. Describe the uses of a topographic map, including location of the different types of terrain.

    Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
    Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6
13. Apply principles of legal land description.
    a. Write, read, and locate parcels of land using legal land descriptions.
    b. Observe the records of timber and land deeds in the county courthouse.

    Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
    Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6
14. Explain tree measurement techniques.
    a. Define terms, including board feet, cord, diameter at breast height (DBH), diameter, diameter inside bark (DIB), diameter outside bark (DOB), form class, one thousand board feet (MBF), merchantable height, sawlog, sawtimber, and sticks.
    b. Identify tools used in taking tree measurements and associate them with uses, including D-tape, tree stick, tree calipers, clinometer, pentaprism caliper, relaskop, and increment borer.
    c. Classify DBH measurements into the correct diameter classes, including one- and two-inch classes.
    d. Determine the correct location of DBH measurements, including trees on level ground, slopes, leaning, forking, and deformed.
    e. Identify merchantable height, including heights for sawtimber, pulpwood, and specialty products.
    f. Distinguish among the major log rules, including Doyle, Scribner, and International log rules.
    g. Draw tally symbols, including dot-tally method.

Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
Workplace Skills (See Appendix B): WP1, WP2, WP6

15. Perform volume measurement of standing timber.
    a. Determine the volume of standing timber, including volume computation from DBH and height measurements.

Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
Workplace Skills (See Appendix B): WP1, WP2, WP6

16. Perform volume measurement of sawlogs.
    a. Calculate the net volume of logs, including measuring length and DIB at small end of log to obtain volume and weight scaling of logs for volume.

Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
Workplace Skills (See Appendix B): WP1, WP2, WP6

17. Apply procedures for cruising timber.
    a. Describe terms associated with cruising, including aerial cruising, basal area, board foot, bole, circumference, cord, cull, cunit, diameter at breast height (DBH), dendrometer, diameter, DIB, DOB, form class, hypsometer, MBF, merchantable height, sawlog, sawtimber, statistical sampling, sticks, taper, and whorl.
    b. Describe tools and materials used in cruising, including hypsometers, dendrometers, compasses, increment borers, and wedge prisms.
    c. Describe reasons for conducting a cruise, including management and procurement.
    d. Describe factors that determine cruise intensity, including acreage, species, timber density, value, and purpose of cruise.

Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
Workplace Skills (See Appendix B): WP1, WP2, WP6

18. Perform timber cruising.
    a. Describe the cruising techniques, including plot and strip cruising.
    b. Perform a cruise and volume calculation, including a strip and plot cruise.

Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
Workplace Skills (See Appendix B): WP1, WP2, WP6

CURRICULUM FRAMEWORK

Course Name: Forestry II

Course CIP Code: 03.0490

Course Description: Forestry II is an instructional program that orients an individual to forestry occupations. Study in this course allows an individual to prepare for employment or continued education in the occupation of forestry. Units of study included are: Identify Forests and Forest Products, Employability Skills/FFA Activities, Forest Management Practices, Advanced Timber Cruising, Timber Marketing, Timber Harvesting, Reforestation, Forest Fire, and Forest Insects and Disease. (2-2½ Carnegie Units, depending upon time spent in the course)

Competencies and Suggested Objectives:

1. Apply procedures to identify forest types.
   a. Define terms associated with forest types.
   b. Distinguish between softwoods and hardwoods, including all characteristics of hardwoods and softwoods.
   c. Identify forest regions of the United States on a map, including Pacific Coast, Rocky Mountains, Northern, Central Hardwood, Southern, and Tropical.
   d. Identify the principal species associated with the forest regions of Mississippi, including oak-pine, oak-gum-cypress, oak-hickory, loblolly-shortleaf, and longleaf-slash.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S2, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6
2. Apply procedures to identify the physical properties of wood.
   a. Identify the physical properties of wood according to wood uses, including specific gravity, grain, strength, stiffness, bending, hardness, toughness, ability to be stained, and chemical properties.
   b. Describe Mississippi wood products according to their importance to the state and local economy, including sawlogs, pulpwood products, poles and posts, veneer, furniture products, miscellaneous, and by-products.
   c. Describe the role of recycling in the forest products industry, including impact on forest management and harvesting practices.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S2, S5, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6
3. Develop employability skills.
   a. Prepare a computerized resume containing essential information including personal information, education, and employment experience using correct grammar, spelling, and punctuation.

b. Complete job application forms including correct grammar, spelling, and punctuation.
c. Explain procedures for job interviews using correct job etiquette.
d. Demonstrate the role of an applicant in a job interview using correct interview procedures.
e. Explore job opportunities using a computerized database.

Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6
Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6

4. Participate in FFA leadership activities associated with forestry.
   a. Identify FFA organizational activities that promote and recognize achievements in forestry, including personal development activities, seminars, leadership conferences, national and international exchange programs, education experience with industry, and personal and community development programs.
   b. Identify the benefits of FFA participation to an individual and to the forestry industry, including personal growth and development, exposure to the forestry industry environment, and multicultural experiences.
   c. Identify opportunities for members in the FFA organization, including personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6
5. Explain forest management practices.
   a. Define terms associated with applying forest management practices, including age classifications, forest management, improvement cutting, selection cutting, timber stand improvement, stand types, and wildlife management.
   b. Identify the role of forest management, including forest crops, management of stands, measurement of stands, goals and objectives of the landowner, and voluntary best management practices.
   c. Describe forest management practices, including silviculture, reproduction, and harvest cuttings.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, S2, S4
   Workplace Skills (See Appendix B): WP1, WP2, WP6
6. Perform forest management practices.
   a. Describe the purposes of intermediate cutting in forest management, including maximizing growth, control spacing, and removal of undesirable trees.
   b. Determine the type of intermediate cut, including pre-commercial, pulpwood, release, and salvage.
   c. Classify timber stand improvement needs, including thin overstocked stands, prescribed burning, herbicide use, and salvage cuts.

Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S2, S8
Workplace Skills (See Appendix B): WP1, WP2, WP6

7. Plan and conduct a timber cruise.
   a. Prepare a cruise layout, including drawing of a diagram describing a 10% sample systematic grid.
   b. Conduct a timber cruise and determine tract volume and values, including 10%, 20%, and 100% samples.
   c. Determine tract volume using variable plot sampling with a 10 factor prism.
   d. Compute tract volume using data recorder assisted by computer software.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6
8. Explain timber marketing procedures.
   a. Define terms associated with timber marketing, including compliance, management prescriptions, offeree, and offeror.
   b. Describe marketing practices for selling at the highest return, including marking, estimating timber, determining the value of timber, and selling the timber for the highest price.
   c. Identify potential markets, including pulp-paper mills, post mill, sawmill, specialty markets, export markets, firewood sales, and distance to these markets.
   d. Determine the highest value of a timber stand, including preparing a prospectus and a timber sale contract.
   e. Describe legal documents used in the sale and harvesting of timber, including the prospectus, timber sale contract, timber deed, and harvesting contract.
   f. Describe desirable post-harvest land conditions which may be specified in a harvesting contract, including forest management practices required by law.
   g. Describe logistics of transporting timber to markets, including the effect upon the price received by the producer.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6
9. Explain timber harvesting procedures.
   a. Define terms associated with timber harvesting, including harvesting layout, felling, topping, bunching, skidding, merchandising, loading, and hauling.
   b. Describe the methods of harvesting timber, including selection, seed-tree, shelterwood, clear-cut, and mechanical.
   c. Identify the products of harvesting, including pulpwood, sawlogs, and specialty wood products.
   d. Develop a timber harvesting plan, including boundary marking, skid trails, landings, roads, post-harvest maintenance, and inspection.

e. Identify types of harvesting equipment, including saws, feller-bunchers, pre-haulers, skidders, whole tree chippers, loaders, and hauling vehicles.
f. Observe timber harvesting operations, including forest management practices of pulpwood and saw logs.
g. Describe desirable post-harvesting land conditions, including disposition of non-merchantable timber, dead trees, tree tops, soil cover, damage caused by logging equipment, and forest management practices required by law.

Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, M7, S8
Workplace Skills (See Appendix B): WP1, WP2, WP6

10. Explain reforestation practices.
    a. Define reforestation terms, including planting tools, methods of seeding, and site preparation.
    b. Identify the sources of tree seedlings, including private, state, and federal nurseries.
    c. Describe the methods of handling seedlings, including plant as soon as possible, heel in, and keep in cold storage.
    d. Describe the methods of planting, including direct seeding, hand planting, and machine planting.
    e. Describe the different types of site preparation, including roll chop, shearing, burning, chemical, and piling.
    f. Describe the types of reforestation, including artificial and natural means.
    g. Describe the economics of reforestation.
    h. Identify federal and state reforestation programs available locally.

    Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, M7, S8
    Workplace Skills (See Appendix B): WP1, WP2, WP6
11. Perform reforestation practices.
    a. Plant seedlings, including using all available methods.
    b. Perform a compliance check, including carrying out a standard Mississippi Forestry Commission compliance check.

    Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S8
    Workplace Skills (See Appendix B): WP1, WP2, WP6
12. Explain forest fire management practices.
    a. Define the terms associated with forest fires, including types of fires, behavior, fuels, controls, and weather conditions.
    b. Identify the elements of the fire triangle, including heat, fuel, and oxygen.
    c. Identify the classes of fires, including ground, surface, and crown.
    d. Identify the methods of attack, including direct and indirect.
    e. Identify fire fighting tools according to their uses, including rakes, swatters, cutting tools, back pack, sprayer, drip torch, and fire plows.

    Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, S8
    Workplace Skills (See Appendix B): WP1, WP2, WP6

13. Apply forest fire management techniques.
    a. Develop a prescribed burning plan, including fire lanes, weather conditions, wind speed and direction, timber type, fuel conditions, and manpower.
    b. Observe a prescribed burn operation, including requesting of the required burning permit.
    c. Develop a forest fire prevention plan, including fire lanes, section roads, prescribed burning, and emergency notification procedures.

    Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, M7, S8
    Workplace Skills (See Appendix B): WP1, WP2, WP6
14. Apply forest insect and disease control.
    a. Define the terms associated with forest insects and diseases, including wood damage, leaf eaters, wood eaters, epidemic, predator, habitat, diseases, and signs of damage.
    b. Identify the reasons for identifying insect and disease damage, including prevention of epidemics and loss of timber volume.
    c. Identify the insect or disease with the symptoms of damage, including leaf eaters, wood eaters, sap eaters, phloem eaters, core borers, root feeders, and terminal feeders.
    d. Describe the various methods used to control insects and diseases, including direct control and indirect control.
    e. Identify insect and disease damage, including comparing the damage observed to the insect that caused the damage.
    f. Describe aerial forest detection procedures, including those for insect and disease problems.

    Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, S8,
    Workplace Skills (See Appendix B): WP1, WP2, WP6

SECTION II:

CURRICULUM GUIDE

FOR

FORESTRY

FORESTRY I

FORESTRY I
UNIT 1: EXPLORING THE WORLD OF FORESTRY **(4 days)**

Competencies and Suggested Objectives:

1. Explain the importance of forestry.
   a. Describe the elements of a forest community, including trees, plants, shrubs, soil, water, and animal life.
   b. Describe the importance of trees and forests, including products, employment, climate, air quality, erosion, and recreation.
   c. Describe the amount of forested land worldwide and in the United States, including acres of forest land and acres of commercial land within the local county or regional area.
   d. Describe the history of forestry, including the importance of forestry to the South and to Mississippi.
   e. Describe the importance of forests in the South, including growing season, timber inventory, and economic impact.
   f. Describe resources considered in multiple-use forest management, including timber, soil, wildlife, recreation, and water.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S2, S4
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6
2. Explain careers in the field of forestry.
   a. Identify the careers available in the field of forestry, including educational requirements, job opportunities, duties, and responsibilities for professional, technical, and forestry workers.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6
3. Explain the impact of federal and state regulations on forestry operations.
   a. Describe the federal regulations impacting forest operations.
   b. Describe the state regulations impacting forest operations.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S2, S4
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6

Suggested Teaching Strategies:

1. Explain the importance of forestry.
   a. Discuss the elements of a forest community, including trees, plants, shrubs, soil, water, and animal life.
   b. Use educational media to present the importance of trees and forests, including products, employment, climate, air quality, erosion, and recreation.

c. *Utilize maps and imaging to present the amount of forested land worldwide and in the United States, including acres of forest land and acres of commercial land within the local county or regional area.*
d. *Describe the history of forestry, including the importance of forestry to the South and to Mississippi.*
e. *Describe the importance of forests in the South, including growing season, timber inventory, and economic impact.*
f. *Conduct field trip and invite a resource person to discuss resources considered in multiple-use forest management, including timber, soil, wildlife, recreation, and water.*

2. *Explain careers in the field of forestry.*
   a. *Invite resource person to discuss the careers available in the field of forestry and use computer software to present careers in forestry, including educational requirements, job opportunities, duties, and responsibilities for professional, technical, and forestry workers.*
3. *Explain the impact of federal and state regulations on forestry operations.*
   a. *Describe the federal regulations impacting forest operations.*
   b. *Describe the state regulations impacting forest operations.*

Suggested Assessment Strategies:

1. *Explain the importance of forestry.*
   a. *Test – The elements of a forest community, including trees, plants, shrubs, soil, water, and animal life.*
   b. *Test – The importance of trees and forests, including products, employment, climate, air quality, erosion, and recreation.*
   c. *Oral and/or written reports – Use maps and imaging to present the amount of forested land worldwide and in the United States, including acres of forest land and acres of commercial land within the local county or regional area.*
   d. *Oral and written assignment – Describe the history of forestry, including the importance of forestry to the South and to Mississippi.*
   e. *Oral or written report – Describe the importance of forests in the South, including growing season, timber inventory, and economic impact.*
   f. *Test – Field trip and resource person presentation on resources considered in multiple-use forest management, including timber, soil, wildlife, recreation, and water.*
2. *Explain careers in the field of forestry.*
   a. *Test – The careers available in the field of forestry, including educational requirements, job opportunities, duties, and responsibilities for professional, technical, and forestry workers.*
3. *Explain the impact of federal and state regulations on forestry operations.*
   a. *Test - Describe the federal regulations impacting forest operations.*
   b. *Test - Describe the state regulations impacting forest operations.*

Suggested References:

Camp, W. G. and Daugherty, Thomas B. Managing our Natural Resources. Albany, NY: Delmar. 1991.

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

Holland, I. I., Rolfe, G. L., and Anderson, D. A. Forests and Forestry (4th ed.). Danville, IL: Interstate. 1990.

FORESTRY I
UNIT 2: LEADERSHIP/FFA ACTIVITIES **(4 days)**

Competencies and Suggested Objectives:

1. Explain the benefits of FFA participation.
   a. Identify FFA organizational activities that promote and recognize achievements in forestry, including career development events, personal development seminars, leadership conferences, national and international exchange programs, education experience with industry, and personal and community development programs.
   b. Identify the benefits of FFA participation to an individual and to the forestry industry, including personal growth and development, exposure to the forestry industry environment, and multicultural experiences.
   c. Identify opportunities for members in the FFA organization, including personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6
2. Demonstrate group leadership skills.
   a. Develop and present a 3-5 minute speech on a forestry topic, including guidelines for preparing a successful speech, speech outlining, resource development, writing skills, and presentation skills.
   b. Describe the purposes and functions of parliamentary procedure, including the ability to conduct a meeting, methods of voting, motions and their handling, and officer positions and functions.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6

Suggested Teaching Strategies:

1. *Explain the benefits of FFA participation.*
   a. *Assist students to identify FFA organizational activities that promote and recognize achievements in forestry, including career development events, personal development seminars, leadership conferences, national and international exchange programs, education experience with industry, and personal and community development programs.*
   b. *Assist students to identify the benefits of FFA participation to an individual and to the forestry industry, including personal growth and development, exposure to the forestry industry environment, and multicultural experiences.*

c. *Discuss opportunities for members in the FFA organization, including personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.*

2. *Demonstrate group leadership skills.*
   a. *Assist students to develop and present a 3-5 minute speech on a forestry topic, including guidelines for preparing a successful speech, speech outlining, resource development, writing skills, and presentation skills.*
   b. *Assist students to describe the purposes and functions of parliamentary procedure, including the ability to conduct a meeting, methods of voting, motions and their handling, and officer positions and functions.*

Suggested Assessment Strategies:

1. *Explain the benefits of FFA participation.*
   a. *Oral/Written Report – Identify FFA organizational activities that promote and recognize achievements in forestry, including career development events, personal development seminars, leadership conferences, national and international exchange programs, education experience with industry, and personal and community development programs.*
   b. *Oral/Written Report – Identify the benefits of FFA participation to an individual and to the forestry industry, including personal growth and development, exposure to the forestry industry environment, and multicultural experiences.*
   c. *Oral/Written Report – Identify opportunities for members in the FFA organization, including personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.*
2. *Demonstrate group leadership skills.*
   a. *Performance Activity – Develop and present a 3-5 minute speech on a forestry topic, including guidelines for preparing a successful speech, speech outlining, resource development, writing skills, and presentation skills.*
   b. *Performance Activity – Describe the purposes and functions of parliamentary procedure, including the ability to conduct a meeting, methods of voting, motions and their handling, and officer positions and functions.*

Suggested References:

Crockett, C., Stevens, S. & Stewart B. Core Employment Skills. Columbia, MO: Instructional Materials Laboratory, University of Missouri. 1990.

National FFA Organization. FFA Student Handbook. Alexandria, VA: Author. 1995.

National FFA Organization. National FFA Career Development. Alexandria, VA: Author. 1995.

National FFA Organization. National FFA Manual. Alexandria, VA: Author. 1995.

Robert's Rules of Order.

FORESTRY I
UNIT 3: FOREST SAFETY **(4 days)**

Competencies and Suggested Objectives:

1. Explain forest safety practices.
   a. Describe environmental hazards, including heat, cold, insects, wildlife, and topographical hazards.
   b. Describe first aid and first aid equipment used in forestry work.
   c. Describe job site safety practices, including the hazards, carelessness, safety equipment, safety regulations, and prevention of accidents.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S8
   Workplace Skills (See Appendix B): WP1, WP6

Suggested Teaching Strategies:

1. Explain forest safety practices.
   a. Discuss environmental hazards, including heat, cold, insects, wildlife, and topographical hazards.
   b. Discuss first aid and first aid equipment used in forestry work.
   c. Discuss job site safety practices, including the hazards, carelessness, safety equipment, safety regulations, and prevention of accidents.

Suggested Assessment Strategies:

1. Explain forest safety practices.
   a. Oral/Written Report – Describe environmental hazards, including heat, cold, insects, wildlife, and topographical hazards.
   b. Oral/Written Report – Describe first aid and first aid equipment used in forestry work.
   c. Performance Activity – Describe job site safety practices, including the hazards, carelessness, safety equipment, safety regulations, and prevention of accidents.

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

FORESTRY I
UNIT 4: TREE GROWTH AND STAND DEVELOPMENT **(20 days)**

Competencies and Suggested Objectives:

1. Explain tree physiology.
   a. Describe the main parts of a tree, including trunk, crown, and roots along with their functions.
   b. Describe tree respiration and photosynthesis, including respiration, transfer of water, minerals, nutrients, and production of food.
   c. Describe environmental and biological factors that affect tree growth, including temperature, moisture, light, air, soil, tolerance, and hardiness.
   d. Describe the methods of tree reproduction, including sprouts, seeds, and suckers.
   e. Identify characteristics of tree growth, including height and diameter growth.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S2, S4
   Workplace Skills (See Appendix B): WP2, WP6
2. Explain forest stand development.
   a. Identify stands according to classifications, including age, size, and composition.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S2, S8
   Workplace Skills (See Appendix B): WP2, WP6
3. Explain applications of tissue culture, cloning, and other advances in biotechnology to forestry.
   a. Describe applications of tissue culture, cloning, and other advances in biotechnology to forestry.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP4, WP6

Suggested Teaching Strategies:

1. *Explain tree physiology.*
   a. *Discuss the main parts of a tree, including trunk, crown, and roots along with their functions.*
   b. *Discuss tree respiration and photosynthesis, including respiration, transfer of water, minerals, nutrients, and production of food.*
   c. *Observe environmental and biological factors that affect tree growth, including temperature, moisture, light, air, soil, tolerance, and hardiness.*
   d. *Assist students to describe the methods of tree reproduction, including sprouts, seeds, and suckers.*
   e. *Identify characteristics of tree growth, including height and diameter growth.*

2. *Explain forest stand development.*
   a. *Identify stands according to classifications, including age, size, and composition.*
3. *Explain applications of tissue culture, cloning, and other advances in biotechnology to forestry.*
   a. *Oral/written report to describe applications of tissue culture, cloning, and other advances in biotechnology to forestry.*

Suggested Assessment Strategies:

1. *Explain tree physiology.*
   a. *Test – Describe the main parts of a tree, including trunk, crown, and roots along with their functions.*
   b. *Test – Describe tree respiration and photosynthesis, including respiration, transfer of water, minerals, nutrients, and production of food.*
   c. *Test – Describe environmental and biological factors that affect tree growth, including temperature, moisture, light, air, soil, tolerance, and hardiness.*
   d. *Test – Describe the methods of tree reproduction, including sprouts, seeds, and suckers.*
   e. *Performance Activity – Identify characteristics of tree growth, including height and diameter growth.*
2. *Explain forest stand development.*
   a. *Performance Activity – Identify stands according to classifications, including age, size, and composition.*
3. *Explain applications of tissue culture, cloning, and other advances in biotechnology to forestry.*
   a. *Oral /Written Report – Describe applications of tissue culture, cloning, and other advances in biotechnology to forestry.*

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

FORESTRY I
UNIT 5: DENDROLOGY **(25 days)**

Competencies and Suggested Objectives:

1. Explain the tree classification system.
   a. Identify nomenclature and taxonomy terms, including common name and binomial name.
   b. Describe identifying characteristics of trees, including fruit, leaves, twigs, bark, and tree form.
   c. Describe the economic importance of species of trees, including the uses made of wood products from each species.
   d. Collect leaves and bark samples of commercially valuable species found locally.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S2, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. *Explain the tree classification system.*
   a. *Discuss nomenclature and taxonomy terms, including common name and binomial name.*
   b. *Describe identifying characteristics of trees, including fruit, leaves, twigs, bark, and tree form.*
   c. *Describe the economic importance of species of trees, including the uses made of wood products from each species.*
   d. *Conduct field trips to collect leaves and bark samples of commercially valuable species found locally.*

Suggested Assessment Strategies:

1. *Explain the tree classification system.*
   a. *Test – Identify nomenclature and taxonomy terms, including common name and binomial name.*
   b. *Performance Activity – Describe identifying characteristics of trees, including fruit, leaves, twigs, bark, and tree form.*
   c. *Oral/Written Report – Describe the economic importance of species of trees, including the uses made of wood products from each species.*
   d. *Performance Activity – Collect leaves and bark samples of commercially valuable species found locally.*

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

FORESTRY I
UNIT 6: FOREST SURVEYING AND MAPPING **(25 days)**

Competencies and Suggested Objectives:

1. Explain concepts of forest surveying.
   a. Define terms, including bearings, azimuths, chaining, boundary lines, angles, surveying, and traversing.
   b. Describe the importance of surveying to forestry, including timber sales, land measurement, boundary marking, and mapping.
   c. Identify characteristics of a forest survey, including use of compass, measuring distances, and mapping.
   d. Identify surveying tools, including compass, chain, plumb bob, and range pole.
   e. Label parts of a compass, including magnetic needle, pivot point, housing graduated in degrees, and sighting mirror.
   f. Identify compass measurements and symbols, including azimuths, bearings, degrees, minutes, and seconds.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6
2. Perform forestry surveying and mapping techniques.
   a. Determine the number of paces per chain using common pacing techniques.
   b. Perform compass, pacing, and chaining skills, including completing a traverse of a selected area.
   c. Utilize new technologies for forest surveying and mapping, including satellite imaging and global positioning system.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S2, S4
   Workplace Skills (See Appendix B): WP2, WP6

Suggested Teaching Strategies:

1. *Explain concepts of forest surveying.*
   a. Discuss terms, including bearings, azimuths, chaining, boundary lines, angles, surveying, and traversing.
   b. Discuss the importance of surveying to forestry, including timber sales, land measurement, boundary marking, and mapping.
   c. Identify characteristics of a forest survey, including use of compass, measuring distances, and mapping.
   d. Identify surveying tools, including compass, chain, plumb bob, and range pole.
   e. Point out parts of a compass, including magnetic needle, pivot point, housing graduated in degrees, and sighting mirror.

f. Explain compass measurements and symbols, including azimuths, bearings, degrees, minutes, and seconds.

2. Perform forestry surveying and mapping techniques.

a. Demonstrate how to determine the number of paces per chain using common pacing techniques.

b. Demonstrate how to perform compass, pacing, and chaining skills, including completing a traverse of a selected area.

c. Demonstrate how to utilize new technologies for forest surveying and mapping, including satellite imaging and global positioning system.

Suggested Assessment Strategies:

1. Explain concepts of forest surveying.

a. Test – Define terms, including bearings, azimuths, chaining, boundary lines, angles, surveying, and traversing.

b. Oral/Written Report – Describe the importance of surveying to forestry, including timber sales, land measurement, boundary marking, and mapping.

c. Oral/Written Report – Identify characteristics of a forest survey, including use of compass, measuring distances, and mapping.

d. Performance Activity – Identify surveying tools, including compass, chain, plumb bob, and range pole.

e. Performance Activity – Label parts of a compass, including magnetic needle, pivot point, housing graduated in degrees, and sighting mirror.

f. Performance Activity – Identify compass measurements and symbols, including azimuths, bearings, degrees, minutes, and seconds.

2. Perform forestry surveying and mapping techniques.

a. Performance Activity – Determine the number of paces per chain using common pacing techniques.

b. Performance Activity – Perform compass, pacing, and chaining skills, including completing a traverse of a selected area.

c. Performance Activity – Utilize new technologies for forest surveying and mapping, including satellite imaging and global positioning system.

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

FORESTRY I
UNIT 7: LEGAL LAND DESCRIPTION **(20 days)**

Competencies and Suggested Objectives:

1. Explain the legal land description system used in Mississippi.
   a. Define legal land description terms, including bearing, blaze, contour, elevation, legend, plot, sea level, and topographic map.
   b. Describe reasons for land location in forestry, including retrace, location, and layout of boundaries.
   c. Distinguish among types of legal land descriptions, including United States Public Land Survey System (USPLSS), lot and block system, Vara, and metes and bounds.
   d. Describe the United States Public Land Survey System, including baseline, meridians, parallels, initial point, townships, and range lines.
   e. Identify the principal meridians, baselines, and initial points in Mississippi, including location of these lines on a map.
   f. Describe information found in a map legend, including direction, land, water, structures, and scale.
   g. Describe the uses of a topographic map, including location of the different types of terrain.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6
2. Apply principles of legal land description.
   a. Write, read, and locate parcels of land using legal land descriptions.
   b. Observe the records of timber and land deeds in the county courthouse.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6

Suggested Teaching Strategies:

1. *Explain the legal land description system used in Mississippi.*
   a. Discuss legal land description terms, including bearing, blaze, contour, elevation, legend, plot, sea level, and topographic map.
   b. Describe reasons for land location in forestry, including retrace, location, and layout of boundaries.
   c. Distinguish among types of legal land descriptions, including United States Public Land Survey System (USPLSS), lot and block system, Vara, and metes and bounds.
   d. Describe the United States Public Land Survey System, including baseline, meridians, parallels, initial point, townships, and range lines.
   e. Identify the principal meridians, baselines, and initial points in Mississippi, including location of these lines on a map.

f. *Describe information found in a map legend, including direction, land, water, structures, and scale.*
g. *Describe the uses of a topographic map, including location of the different types of terrain.*

2. *Apply principles of legal land description.*
   a. *Demonstrate how to write, read, and locate parcels of land using legal land descriptions.*
   b. *Conduct a field trip to observe the records of timber and land deeds in the county courthouse.*

Suggested Assessment Strategies:

1. *Explain the legal land description system used in Mississippi.*
   a. *Test – Define legal land description terms including bearing, blaze, contour, elevation, legend, plot, sea level, and topographic map.*
   b. *Test – Describe reasons for land location in forestry, including retrace, location, and layout of boundaries.*
   c. *Test – Distinguish among types of legal land descriptions, including United States Public Land Survey System (USPLSS), lot and block system, Vara, and metes and bounds.*
   d. *Test – Describe the United States Public Land Survey System, including baseline, meridians, parallels, initial point, townships, and range lines.*
   e. *Performance Activity – Identify the principal meridians, baselines, and initial points in Mississippi, including location of these lines on a map.*
   f. *Performance Activity – Describe information found in a map legend, including direction, land, water, structures, and scale.*
   g. *Oral/Written Report – Describe the uses of a topographic map, including location of the different types of terrain.*
2. *Apply principles of legal land description.*
   a. *Performance Activity – Write, read, and locate parcels of land using legal land descriptions.*
   b. *Performance Activity – Observe the records of timber and land deeds in the county courthouse.*

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

Holland, I. I., Rolfe, G. L., and Anderson, D. A. Forests and Forestry (4th ed.). Danville, IL: Interstate. 1990.

FORESTRY I
UNIT 8: TREE AND LOG MEASUREMENTS **(25 days)**

Competencies and Suggested Objectives:

1. Explain tree measurement techniques.
   a. Define terms, including board feet, cord, diameter at breast height (DBH), diameter, diameter inside bark (DIB), diameter outside bark (DOB), form class, one thousand board feet (MBF), merchantable height, sawlog, sawtimber, and sticks.
   b. Identify tools used in taking tree measurements and associate them with uses, including D-tape, tree stick, tree calipers, clinometer, pentaprism caliper, relaskop, and increment borer.
   c. Classify DBH measurements into the correct diameter classes, including one- and two-inch classes.
   d. Determine the correct location of DBH measurements, including trees on level ground, slopes, leaning, forking, and deformed.
   e. Identify merchantable height, including heights for sawtimber, pulpwood, and specialty products.
   f. Distinguish among the major log rules, including Doyle, Scribner, and International log rules.
   g. Draw tally symbols, including dot-tally method.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6
2. Perform volume measurement of standing timber.
   a. Determine the volume of standing timber, including volume computation from DBH and height measurements.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6
3. Perform volume measurement of sawlogs.
   a. Calculate the net volume of logs, including measuring length and DIB at small end of log to obtain volume and weight scaling of logs for volume.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. *Explain tree measurement techniques.*
   a. *Discuss terms, including board feet, cord, diameter at breast height (DBH), diameter, diameter inside bark (DIB), diameter outside bark (DOB), form class, one thousand board feet (MBF), merchantable height, sawlog, sawtimber, and sticks.*

b. *Demonstrate tools used in taking tree measurements and associate them with uses, including D-tape, tree stick, tree calipers, clinometer, pentaprism caliper, relaskop, and increment borer.*
c. *Assist students to classify DBH measurements into the correct diameter classes, including one- and two-inch classes.*
d. *Demonstrate how to determine the correct location of DBH measurements, including trees on level ground, slopes, leaning, forking, and deformed.*
e. *Identify merchantable height, including heights for sawtimber, pulpwood, and specialty products.*
f. *Distinguish among the major log rules, including Doyle, Scribner, and International log rules.*
g. *Demonstrate how to draw tally symbols, including dot-tally method.*

2. *Perform volume measurement of standing timber.*
   a. *Demonstrate how to determine the volume of standing timber, including volume computation from DBH and height measurements.*
3. *Perform volume measurement of sawlogs.*
   a. *Demonstrate how to calculate the net volume of logs, including measuring length and DIB at small end of log to obtain volume and weight scaling of logs for volume.*

Suggested Assessment Strategies:

1. *Explain tree measurement techniques.*
   a. *Test – Define terms, including board feet, cord, diameter at breast height (DBH), diameter, diameter inside bark (DIB), diameter outside bark (DOB), form class, one thousand board feet (MBF), merchantable height, sawlog, sawtimber, and sticks.*
   b. *Performance Activity – Identify tools used in taking tree measurements and associate them with uses, including D-tape, tree stick, tree calipers, clinometer, pentaprism caliper, relaskop, and increment borer.*
   c. *Performance Activity – Classify DBH measurements into the correct diameter classes, including one- and two-inch classes.*
   d. *Performance Activity – Determine the correct location of DBH measurements, including trees on level ground, slopes, leaning, forking, and deformed.*
   e. *Performance Activity – Identify merchantable height, including heights for sawtimber, pulpwood, and specialty products.*
   f. *Oral/Written Report – Distinguish among the major log rules, including Doyle, Scribner, and International log rules.*
   g. *Performance Activity – Draw tally symbols, including dot-tally method.*
2. *Perform volume measurement of standing timber.*
   a. *Performance Activity – Determine the volume of standing timber, including volume computation from DBH and height measurements.*

3. *Perform volume measurement of sawlogs.*
   a. *Performance Activity – Calculate the net volume of logs, including measuring length and DIB at small end of log to obtain volume and weight scaling of logs for volume.*

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

Holland, I. I., Rolfe, G. L., and Anderson, D. A. Forests and Forestry (4th ed.). Danville, IL: Interstate. 1990.

FORESTRY I
UNIT 9: INTRODUCTION TO TIMBER CRUISING **(29 days)**

Competencies and Suggested Objectives:

1. Apply procedures for cruising timber.
   a. Describe terms associated with cruising, including aerial cruising, basal area, board foot, bole, circumference, cord, cull, cunit, diameter at breast height (DBH), dendrometer, diameter, DIB, DOB, form class, hypsometer, MBF, merchantable height, sawlog, sawtimber, statistical sampling, sticks, taper, and whorl.
   b. Describe tools and materials used in cruising, including hypsometers, dendrometers, compasses, increment borers, and wedge prisms.
   c. Describe reasons for conducting a cruise, including management and procurement.
   d. Describe factors that determine cruise intensity, including acreage, species, timber density, value, and purpose of cruise.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6
2. Perform timber cruising.
   a. Describe the cruising techniques, including plot and strip cruising.
   b. Perform a cruise and volume calculation, including a strip and plot cruise.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. *Apply procedures for cruising timber.*
   a. *Discuss terms associated with cruising, including aerial cruising, basal area, board foot, bole, circumference, cord, cull, cunit, diameter at breast height (DBH), dendrometer, diameter, DIB, DOB, form class, hypsometer, MBF, merchantable height, sawlog, sawtimber, statistical sampling, sticks, taper, and whorl.*
   b. *Describe tools and materials used in cruising, including hypsometers, dendrometers, compasses, increment borers, and wedge prisms.*
   c. *Describe reasons for conducting a cruise, including management and procurement.*
   d. *Assist students to describe factors that determine cruise intensity, including acreage, species, timber density, value, and purpose of cruise.*
2. *Perform timber cruising.*
   a. *Describe the cruising techniques, including plot and strip cruising.*
   b. *Demonstrate how to perform a cruise and volume calculation, including a strip and plot cruise.*

Suggested Assessment Strategies:

1. *Apply procedures for cruising timber.*
   a. *Test – Describe terms associated with cruising, including aerial cruising, basal area, board foot, bole, circumference, cord, cull, cunit, diameter at breast height (DBH), dendrometer, diameter, DIB, DOB, form class, hypsometer, MBF, merchantable height, sawlog, sawtimber, statistical sampling, sticks, taper, and whorl.*
   b. *Oral/Written Report – Describe tools and materials used in cruising, including hypsometers, dendrometers, compasses, increment borers, and wedge prisms.*
   c. *Oral/Written Report – Describe reasons for conducting a cruise, including management and procurement.*
   d. *Oral/Written Report – Describe factors that determine cruise intensity, including acreage, species, timber density, value, and purpose of cruise.*
2. *Perform timber cruising.*
   a. *Test – Describe the cruising techniques, including plot and strip cruising.*
   b. *Performance Activity – Perform a cruise and volume calculation, including a strip and plot cruise.*

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

Holland, I. I., Rolfe, G. L., and Anderson, D. A. Forests and Forestry (4th ed.). Danville, IL: Interstate. 1990.

FORESTRY II

FORESTRY II
UNIT 1: IDENTIFY FORESTS AND FOREST PRODUCTS (4 days)

Competencies and Suggested Objectives:

1. Apply procedures to identify forest types.
   a. Define terms associated with forest types.
   b. Distinguish between softwoods and hardwoods, including all characteristics of hardwoods and softwoods.
   c. Identify forest regions of the United States on a map, including Pacific Coast, Rocky Mountains, Northern, Central Hardwood, Southern, and Tropical.
   d. Identify the principal species associated with the forest regions of Mississippi, including oak-pine, oak-gum-cypress, oak-hickory, loblolly-shortleaf, and longleaf-slash.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S2, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6
2. Apply procedures to identify the physical properties of wood.
   a. Identify the physical properties of wood according to wood uses, including specific gravity, grain, strength, stiffness, bending, hardness, toughness, ability to be stained, and chemical properties.
   b. Describe Mississippi wood products according to their importance to the state and local economy, including sawlogs, pulpwood products, poles and posts, veneer, furniture products, miscellaneous, and by-products.
   c. Describe the role of recycling in the forest products industry, including impact on forest management and harvesting practices.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S2, S5, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. Apply procedures to identify forest types.
   a. Discuss terms associated with forest types.
   b. Demonstrate how to distinguish between softwoods and hardwoods, including all characteristics of hardwoods and softwoods.
   c. Discuss forest regions of the United States on a map, including Pacific Coast, Rocky Mountains, Northern, Central Hardwood, Southern, and Tropical.
   d. Identify the principal species associated with the forest regions of Mississippi, including oak-pine, oak-gum-cypress, oak-hickory, loblolly-shortleaf, and longleaf-slash.

2. *Apply procedures to identify the physical properties of wood.*
   a. *Demonstrate how to identify the physical properties of wood according to wood uses, including specific gravity, grain, strength, stiffness, bending, hardness, toughness, ability to be stained, and chemical properties.*
   b. *Assist students to describe Mississippi wood products according to their importance to the state and local economy, including sawlogs, pulpwood products, poles and posts, veneer, furniture products, miscellaneous, and by-products.*
   c. *Describe the role of recycling in the forest products industry, including impact on forest management and harvesting practices.*

Suggested Assessment Strategies:

1. *Apply procedures to identify forest types.*
   a. *Test – Define terms associated with forest types.*
   b. *Performance Activity – Distinguish between softwoods and hardwoods, including all characteristics of hardwoods and softwoods.*
   c. *Performance Activity – Identify forest regions of the United States on a map, including Pacific Coast, Rocky Mountains, Northern, Central Hardwood, Southern, and Tropical.*
   d. *Performance Activity – Identify the principal species associated with the forest regions of Mississippi, including oak-pine, oak-gum-cypress, oak-hickory, loblolly-shortleaf, and longleaf-slash.*
2. *Apply procedures to identify the physical properties of wood.*
   a. *Performance Activity – Identify the physical properties of wood according to wood uses, including specific gravity, grain, strength, stiffness, bending, hardness, toughness, ability to be stained, and chemical properties.*
   b. *Oral/Written Report – Describe Mississippi wood products according to their importance to the state and local economy, including sawlogs, pulpwood products, poles and posts, veneer, furniture products, miscellaneous, and by-products.*
   c. *Oral/Written Report – Describe the role of recycling in the forest products industry, including impact on forest management and harvesting practices.*

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

Holland, I. I., Rolfe, G. L., and Anderson, D. A. Forests and Forestry (4th ed.). Danville, IL: Interstate. 1990.

FORESTRY II
UNIT 2: EMPLOYABILITY SKILLS/FFA ACTIVITIES **(4 days)**

Competencies and Suggested Objectives:

1. Develop employability skills.
   a. Prepare a computerized resume containing essential information including personal information, education, and employment experience using correct grammar, spelling, and punctuation.
   b. Complete job application forms including correct grammar, spelling, and punctuation.
   c. Explain procedures for job interviews using correct job etiquette.
   d. Demonstrate the role of an applicant in a job interview using correct interview procedures.
   e. Explore job opportunities using a computerized database.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6
2. Participate in FFA leadership activities associated with forestry.
   a. Identify FFA organizational activities that promote and recognize achievements in forestry, including personal development activities, seminars, leadership conferences, national and international exchange programs, education experience with industry, and personal and community development programs.
   b. Identify the benefits of FFA participation to an individual and to the forestry industry, including personal growth and development, exposure to the forestry industry environment, and multicultural experiences.
   c. Identify opportunities for members in the FFA organization, including personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6

Suggested Teaching Strategies:

1. *Develop employability skills.*
   a. *Demonstrate how to prepare a computerized resume containing essential information including personal information, education, and employment experience using correct grammar, spelling, and punctuation.*
   b. *Demonstrate how to complete job application forms including correct grammar, spelling, and punctuation.*
   c. *Explain procedures for job interviews using correct job etiquette.*

d. *Demonstrate the role of an applicant in a job interview using correct interview procedures.*
e. *Assist students to explore job opportunities using a computerized database.*

2. *Participate in FFA leadership activities associated with forestry.*
   a. *Identify FFA organizational activities that promote and recognize achievements in forestry, including personal development activities, seminars, leadership conferences, national and international exchange programs, education experience with industry, and personal and community development programs.*
   b. *Identify the benefits of FFA participation to an individual and to the forestry industry, including personal growth and development, exposure to the forestry industry environment, and multicultural experiences.*
   c. *Identify opportunities for members in the FFA organization, including personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.*

Suggested Assessment Strategies:

1. *Develop employability skills.*
   a. *Performance Activity – Prepare a computerized resume containing essential information including personal information, education, and employment experience using correct grammar, spelling, and punctuation.*
   b. *Performance Activity – Complete job application forms including correct grammar, spelling, and punctuation.*
   c. *Oral/Written Report – Explain procedures for job interviews using correct job etiquette.*
   d. *Performance Activity – Demonstrate the role of an applicant in a job interview using correct interview procedures.*
   e. *Performance Activity – Explore job opportunities using a computerized database.*
2. *Participate in FFA leadership activities associated with forestry.*
   a. *Oral/Written Report – Identify FFA organizational activities that promote and recognize achievements in forestry, including personal development activities, seminars, leadership conferences, national and international exchange programs, education experience with industry, and personal and community development programs.*
   b. *Oral/Written Report – Identify the benefits of FFA participation to an individual and to the forestry industry, including personal growth and development, exposure to the forestry industry environment, and multicultural experiences.*

c. *Oral/Written Report – Identify opportunities for members in the FFA organization, including personal development, personal recognition, travel, association with persons from other parts of the United States and abroad, career exploration, and self-expression.*

Suggested References:

Crockett, C., Stevens, S. & Stewart B. Core Employment Skills. Columbia, MO: Instructional Materials Laboratory, University of Missouri. 1990.

National FFA Organization. FFA Student Handbook. Alexandria, VA: Author. 1995.

National FFA Organization. National FFA Career Development. Alexandria, VA: Author. 1995.

National FFA Organization. National FFA Manual. Alexandria, VA: Author. 1995.

FORESTRY II
UNIT 3: FOREST MANAGEMENT PRACTICES **(29 days)**

Competencies and Suggested Objectives:

1. Explain forest management practices.
   a. Define terms associated with applying forest management practices, including age classifications, forest management, improvement cutting, selection cutting, timber stand improvement, stand types, and wildlife management.
   b. Identify the role of forest management, including forest crops, management of stands, measurement of stands, goals and objectives of the landowner, and voluntary best management practices.
   c. Describe forest management practices, including silviculture, reproduction, and harvest cuttings.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, S2, S4
   Workplace Skills (See Appendix B): WP1, WP2, WP6
2. Perform forest management practices.
   a. Describe the purposes of intermediate cutting in forest management, including maximizing growth, control spacing, and removal of undesirable trees.
   b. Determine the type of intermediate cut, including pre-commercial, pulpwood, release, and salvage.
   c. Classify timber stand improvement needs, including thin overstocked stands, prescribed burning, herbicide use, and salvage cuts.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S2, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. Explain forest management practices.
   a. Discuss terms associated with applying forest management practices, including age classifications, forest management, improvement cutting, selection cutting, timber stand improvement, stand types, and wildlife management.
   b. Identify the role of forest management, including forest crops, management of stands, measurement of stands, goals and objectives of the landowner, and voluntary best management practices.
   c. Describe forest management practices, including silviculture, reproduction, and harvest cuttings.

2. *Perform forest management practices.*
   a. *Describe the purposes of intermediate cutting in forest management, including maximizing growth, control spacing, and removal of undesirable trees.*
   b. *Demonstrate how to determine the type of intermediate cut, including pre-commercial, pulpwood, release, and salvage.*
   c. *Demonstrate how to classify timber stand improvement needs, including thin overstocked stands, prescribed burning, herbicide use, and salvage cuts.*

Suggested Assessment Strategies:

1. *Explain forest management practices.*
   a. *Test – Define terms associated with applying forest management practices, including age classifications, forest management, improvement cutting, selection cutting, timber stand improvement, stand types, and wildlife management.*
   b. *Oral/Written Report – Identify the role of forest management, including forest crops, management of stands, measurement of stands, goals and objectives of the landowner, and voluntary best management practices.*
   c. *Oral/Written Report – Describe forest management practices, including silviculture, reproduction, and harvest cuttings.*
2. *Perform forest management practices.*
   a. *Oral/Written Report – Describe the purposes of intermediate cutting in forest management, including maximizing growth, control spacing, and removal of undesirable trees.*
   b. *Performance exercise to determine the type of intermediate cut, including pre-commercial, pulpwood, release, and salvage.*
   c. *Performance exercise to classify timber stand improvement needs, including thin overstocked stands, prescribed burning, herbicide use, and salvage cuts.*

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

Holland, I. I., Rolfe, G. L., and Anderson, D. A. Forests and Forestry (4th ed.). Danville, IL: Interstate. 1990.

FORESTRY II
UNIT 4: ADVANCED TIMBER CRUISING **(34 days)**

Competencies and Suggested Objectives:

1. Plan and conduct a timber cruise.
   a. Prepare a cruise layout, including drawing of a diagram describing a 10% sample systematic grid.
   b. Conduct a timber cruise and determine tract volume and values, including 10%, 20%, and 100% samples.
   c. Determine tract volume using variable plot sampling with a 10 factor prism.
   d. Compute tract volume using data recorder assisted by computer software.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. *Plan and conduct a timber cruise.*
   a. *Demonstrate how to prepare a cruise layout, including drawing of a diagram describing a 10% sample systematic grid.*
   b. *Demonstrate how to conduct a timber cruise and determine tract volume and values, including 10%, 20%, and 100% samples.*
   c. *Demonstrate how to determine tract volume using variable plot sampling with a 10 factor prism.*
   d. *Demonstrate how to compute tract volume using data recorder assisted by computer software.*

Suggested Assessment Strategies:

1. *Plan and conduct a timber cruise.*
   a. *Performance Activity – Prepare a cruise layout, including drawing of a diagram describing a 10% sample systematic grid.*
   b. *Performance Activity – Conduct a timber cruise and determine tract volume and values, including 10%, 20%, and 100% samples.*
   c. *Performance Activity – Determine tract volume using variable plot sampling with a 10 factor prism.*
   d. *Performance Activity – Compute tract volume using data recorder assisted by computer software.*

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

Holland, I. I., Rolfe, G. L., and Anderson, D. A. Forests and Forestry (4th ed.). Danville, IL: Interstate. 1990.

FORESTRY II
UNIT 5: TIMBER MARKETING **(12 days)**

Competencies and Suggested Objectives:

1. Explain timber marketing procedures.
   a. Define terms associated with timber marketing, including compliance, management prescriptions, offeree, and offeror.
   b. Describe marketing practices for selling at the highest return, including marking, estimating timber, determining the value of timber, and selling the timber for the highest price.
   c. Identify potential markets, including pulp-paper mills, post mill, sawmill, specialty markets, export markets, firewood sales, and distance to these markets.
   d. Determine the highest value of a timber stand, including preparing a prospectus and a timber sale contract.
   e. Describe legal documents used in the sale and harvesting of timber, including the prospectus, timber sale contract, timber deed, and harvesting contract.
   f. Describe desirable post-harvest land conditions which may be specified in a harvesting contract, including forest management practices required by law.
   g. Describe logistics of transporting timber to markets, including the effect upon the price received by the producer.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. Explain timber marketing procedures.
   a. Discuss terms associated with timber marketing, including compliance, management prescriptions, offeree, and offeror.
   b. Discuss marketing practices for selling at the highest return, including marking, estimating timber, determining the value of timber, and selling the timber for the highest price.
   c. Identify potential markets, including pulp-paper mills, post mill, sawmill, specialty markets, export markets, firewood sales, and distance to these markets.
   d. Demonstrate how to determine the highest value of a timber stand, including preparing a prospectus and a timber sale contract.
   e. Discuss legal documents used in the sale and harvesting of timber, including the prospectus, timber sale contract, timber deed, and harvesting contract.

f. *Describe desirable post-harvest land conditions which may be specified in a harvesting contract, including forest management practices required by law.*
g. *Describe logistics of transporting timber to markets, including the effect upon the price received by the producer.*

Suggested Assessment Strategies:

1. *Explain timber marketing procedures.*
   a. *Test – Define terms associated with timber marketing, including compliance, management prescriptions, offeree, and offeror.*
   b. *Oral/Written Report – Describe marketing practices for selling at the highest return, including marking, estimating timber, determining the value of timber, and selling the timber for the highest price.*
   c. *Oral/Written Report – Identify potential markets, including pulp-paper mills, post mill, sawmill, specialty markets, export markets, firewood sales, and distance to these markets.*
   d. *Performance Activity – Determine the highest value of a timber stand, including preparing a prospectus and a timber sale contract.*
   e. *Oral/Written Report – Describe legal documents used in the sale and harvesting of timber, including the prospectus, timber sale contract, timber deed, and harvesting contract.*
   f. *Oral/Written Report – Describe desirable post-harvest land conditions which may be specified in a harvesting contract, including forest management practices required by law.*
   g. *Oral/Written Report – Describe logistics of transporting timber to markets, including the effect upon the price received by the producer.*

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

Holland, I. I., Rolfe, G. L., and Anderson, D. A. Forests and Forestry (4th ed.). Danville, IL: Interstate. 1990.

FORESTRY II
UNIT 6: TIMBER HARVESTING **(12 days)**

Competencies and Suggested Objectives:

1. Explain timber harvesting procedures.
   a. Define terms associated with timber harvesting, including harvesting layout, felling, topping, bunching, skidding, merchandising, loading, and hauling.
   b. Describe the methods of harvesting timber, including selection, seed-tree, shelterwood, clear-cut, and mechanical.
   c. Identify the products of harvesting, including pulpwood, sawlogs, and specialty wood products.
   d. Develop a timber harvesting plan, including boundary marking, skid trails, landings, roads, post-harvest maintenance, and inspection.
   e. Identify types of harvesting equipment, including saws, feller-bunchers, pre-haulers, skidders, whole tree chippers, loaders, and hauling vehicles.
   f. Observe timber harvesting operations, including forest management practices of pulpwood and saw logs.
   g. Describe desirable post-harvesting land conditions, including disposition of non-merchantable timber, dead trees, tree tops, soil cover, damage caused by logging equipment, and forest management practices required by law.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. *Explain timber harvesting procedures.*
   a. *Discuss terms associated with timber harvesting, including harvesting layout, felling, topping, bunching, skidding, merchandising, loading, and hauling.*
   b. *Describe the methods of harvesting timber, including selection, seed-tree, shelterwood, clear-cut, and mechanical.*
   c. *Identify the products of harvesting, including pulpwood, sawlogs, and specialty wood products.*
   d. *Demonstrate how to develop a timber harvesting plan, including boundary marking, skid trails, landings, roads, post-harvest maintenance, and inspection.*
   e. *Assist students to identify types of harvesting equipment, including saws, feller-bunchers, pre-haulers, skidders, whole tree chippers, loaders, and hauling vehicles.*

f. Field trip to observe timber harvesting operations, including forest management practices of pulpwood and saw logs.

g. Describe desirable post-harvesting land conditions, including disposition of non-merchantable timber, dead trees, tree tops, soil cover, damage caused by logging equipment, and forest management practices required by law.

Suggested Assessment Strategies:

1. Explain timber harvesting procedures.

a. Test – Define terms associated with timber harvesting, including harvesting layout, felling, topping, bunching, skidding, merchandising, loading, and hauling.

b. Oral/Written Report – Describe the methods of harvesting timber, including selection, seed-tree, shelterwood, clear-cut, and mechanical.

c. Oral/Written Report – Identify the products of harvesting, including pulpwood, sawlogs, and specialty wood products.

d. Performance Activity – Develop a timber harvesting plan, including boundary marking, skid trails, landings, roads, post-harvest maintenance, and inspection.

e. Performance Activity – Identify types of harvesting equipment, including saws, feller-bunchers, pre-haulers, skidders, whole tree chippers, loaders, and hauling vehicles.

f. Performance Activity – Observe timber harvesting operations, including forest management practices of pulpwood and saw logs.

g. Oral/Written Report – Describe desirable post-harvesting land conditions, including disposition of non-merchantable timber, dead trees, tree tops, soil cover, damage caused by logging equipment, and forest management practices required by law.

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

Holland, I. I., Rolfe, G. L., and Anderson, D. A. Forests and Forestry (4th ed.). Danville, IL: Interstate. 1990.

FORESTRY II
UNIT 7: REFORESTATION **(14 days)**

Competencies and Suggested Objectives:

1. Explain reforestation practices.
   a. Define reforestation terms, including planting tools, methods of seeding, and site preparation.
   b. Identify the sources of tree seedlings, including private, state, and federal nurseries.
   c. Describe the methods of handling seedlings, including plant as soon as possible, heel in, and keep in cold storage.
   d. Describe the methods of planting, including direct seeding, hand planting, and machine planting.
   e. Describe the different types of site preparation, including roll chop, shearing, burning, chemical, and piling.
   f. Describe the types of reforestation, including artificial and natural means.
   g. Describe the economics of reforestation.
   h. Identify federal and state reforestation programs available locally.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6
2. Perform reforestation practices.
   a. Plant seedlings, including using all available methods.
   b. Perform a compliance check, including carrying out a standard Mississippi Forestry Commission compliance check.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C6, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. *Explain reforestation practices.*
   a. Discuss reforestation terms, including planting tools, methods of seeding, and site preparation.
   b. Identify the sources of tree seedlings, including private, state, and federal nurseries.
   c. Describe the methods of handling seedlings, including plant as soon as possible, heel in, and keep in cold storage.
   d. Describe the methods of planting, including direct seeding, hand planting, and machine planting.
   e. Describe the different types of site preparation, including roll chop, shearing, burning, chemical, and piling.
   f. Describe the types of reforestation, including artificial and natural means.
   g. Discuss the economics of reforestation.

h. Assist students to identify federal and state reforestation programs available locally.

2. Perform reforestation practices.

a. Demonstrate how to plant seedlings, including using all available methods.

b. Demonstrate how to perform a compliance check, including carrying out a standard Mississippi Forestry Commission compliance check.

Suggested Assessment Strategies:

1. Explain reforestation practices.

a. Test – Define reforestation terms, including planting tools, methods of seeding, and site preparation.

b. Oral/Written Report – Identify the sources of tree seedlings, including private, state, and federal nurseries.

c. Oral/Written Report – Describe the methods of handling seedlings, including plant as soon as possible, heel in, and keep in cold storage.

d. Oral/Written Report – Describe the methods of planting, including direct seeding, hand planting, and machine planting.

e. Oral/Written Report – Describe the different types of site preparation, including roll chop, shearing, burning, chemical, and piling.

f. Oral/Written Report – Describe the types of reforestation, including artificial and natural means.

g. Oral/Written Report – Describe the economics of reforestation.

h. Performance Activity – Identify federal and state reforestation programs available locally.

2. Perform reforestation practices.

a. Performance Activity – Plant seedlings, including using all available methods.

b. Performance Activity – Perform a compliance check, including carrying out a standard Mississippi Forestry Commission compliance check.

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

Holland, I. I., Rolfe, G. L., and Anderson, D. A. Forests and Forestry (4th ed.). Danville, IL: Interstate. 1990.

FORESTRY II
UNIT 8: FOREST FIRE MANAGEMENT **(14 days)**

Competencies and Suggested Objectives:

1. Explain forest fire management practices.
   a. Define the terms associated with forest fires, including types of fires, behavior, fuels, controls, and weather conditions.
   b. Identify the elements of the fire triangle, including heat, fuel, and oxygen.
   c. Identify the classes of fires, including ground, surface, and crown.
   d. Identify the methods of attack, including direct and indirect.
   e. Identify fire fighting tools according to their uses, including rakes, swatters, cutting tools, back pack, sprayer, drip torch, and fire plows.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6
2. Apply forest fire management techniques.
   a. Develop a prescribed burning plan, including fire lanes, weather conditions, wind speed and direction, timber type, fuel conditions, and manpower.
   b. Observe a prescribed burn operation, including requesting of the required burning permit.
   c. Develop a forest fire prevention plan, including fire lanes, section roads, prescribed burning, and emergency notification procedures.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, M7, S8
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. *Explain forest fire management practices.*
   a. Discuss the terms associated with forest fires, including types of fires, behavior, fuels, controls, and weather conditions.
   b. Identify the elements of the fire triangle, including heat, fuel, and oxygen.
   c. Identify the classes of fires, including ground, surface, and crown.
   d. Identify the methods of attack, including direct and indirect.
   e. Identify fire fighting tools according to their uses, including rakes, swatters, cutting tools, back pack, sprayer, drip torch, and fire plows.
2. *Apply forest fire management techniques.*
   a. Demonstrate how to develop a prescribed burning plan, including fire lanes, weather conditions, wind speed and direction, timber type, fuel conditions, and manpower.
   b. Field trip to observe a prescribed burn operation, including requesting of the required burning permit.

c. *Demonstrate how to develop a forest fire prevention plan, including fire lanes, section roads, prescribed burning, and emergency notification procedures.*

Suggested Assessment Strategies:

1. *Explain forest fire management practices.*
   a. *Test – Define the terms associated with forest fires, including types of fires, behavior, fuels, controls, and weather conditions.*
   b. *Oral/Written Report – Identify the elements of the fire triangle, including heat, fuel, and oxygen.*
   c. *Oral/Written Report – Identify the classes of fires, including ground, surface, and crown.*
   d. *Oral/Written Report – Identify the methods of attack, including direct and indirect.*
   e. *Oral/Written Report – Identify fire fighting tools according to their uses, including rakes, swatters, cutting tools, back pack, sprayer, drip torch, and fire plows.*
2. *Apply forest fire management techniques.*
   a. *Performance Activity – Develop a prescribed burning plan, including fire lanes, weather conditions, wind speed and direction, timber type, fuel conditions, and manpower.*
   b. *Performance Activity – Observe a prescribed burn operation, including requesting of the required burning permit.*
   c. *Performance Activity – Develop a forest fire prevention plan, including fire lanes, section roads, prescribed burning, and emergency notification procedures.*

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

Holland, I. I., Rolfe, G. L., and Anderson, D. A. Forests and Forestry (4th ed.). Danville, IL: Interstate. 1990.

U.S. Forest Service. Prescribed Burning in Southern Forests. Washington, D.C.: U.S. Department of Agriculture. (n.d.).

FORESTRY II
UNIT 9: FOREST INSECTS AND DISEASE **(12 days)**

Competencies and Suggested Objectives:

1. Apply forest insect and disease control.
   a. Define the terms associated with forest insects and diseases, including wood damage, leaf eaters, wood eaters, epidemic, predator, habitat, diseases, and signs of damage.
   b. Identify the reasons for identifying insect and disease damage, including prevention of epidemics and loss of timber volume.
   c. Identify the insect or disease with the symptoms of damage, including leaf eaters, wood eaters, sap eaters, phloem eaters, core borers, root feeders, and terminal feeders.
   d. Describe the various methods used to control insects and diseases, including direct control and indirect control.
   e. Identify insect and disease damage, including comparing the damage observed to the insect that caused the damage.
   f. Describe aerial forest detection procedures, including those for insect and disease problems.

   Related Academic Topics (See Appendix A): C1, C2, C3, C4, C5, C6, S8,
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. *Apply forest insect and disease control.*
   a. *Discuss the terms associated with forest insects and diseases, including wood damage, leaf eaters, wood eaters, epidemic, predator, habitat, diseases, and signs of damage.*
   b. *Identify the reasons for identifying insect and disease damage, including prevention of epidemics and loss of timber volume.*
   c. *Demonstrate how to identify the insect or disease with the symptoms of damage, including leaf eaters, wood eaters, sap eaters, phloem eaters, core borers, root feeders, and terminal feeders.*
   d. *Describe the various methods used to control insects and diseases, including direct control and indirect control.*
   e. *Demonstrate how to identify insect and disease damage, including comparing the damage observed to the insect that caused the damage.*
   f. *Describe aerial forest detection procedures, including those for insect and disease problems.*

Suggested Assessment Strategies:

1. *Apply forest insect and disease control.*
   a. *Test – Define the terms associated with forest insects and diseases, including wood damage, leaf eaters, wood eaters, epidemic, predator, habitat, diseases, and signs of damage.*
   b. *Oral/Written Report – Identify the reasons for identifying insect and disease damage, including prevention of epidemics and loss of timber volume.*
   c. *Oral/Written Report – Identify the insect or disease with the symptoms of damage, including leaf eaters, wood eaters, sap eaters, phloem eaters, core borers, root feeders, and terminal feeders.*
   d. *Oral/Written Report – Describe the various methods used to control insects and diseases, including direct control and indirect control.*
   e. *Performance Activity – Identify insect and disease damage, including comparing the damage observed to the insect that caused the damage.*
   f. *Oral/Written Report – Describe aerial forest detection procedures, including those for insect and disease problems.*

Suggested References:

CIMC. Forestry. Stillwater, OK: Department of Vocational and Technical Education. 1991.

Holland, I. I., Rolfe, G. L., and Anderson, D. A. Forests and Forestry (4th ed.). Danville, IL: Interstate. 1990.

U.S. Forest Service. Insects and Disease in Southern Forests. Washington, D.C.: U.S. Department of Agriculture. (n.d.).

SECTION III:

RECOMMENDED TOOLS AND EQUIPMENT

RECOMMENDED TOOLS AND EQUIPMENT FOR FORESTRY
(for class size of 20)

1. Axe, Pulaski forester's (5)
2. Bag, tree planting (20)
3. Bar, tree planting (10)
4. Board, portable drawing (20)
5. Calculators (w/trig functions) (10)
6. Caliper, pentaprism w/clinometer mount (24" dia.) (2)
7. Caliper, tree (10)
8. Clinometer (Suunto) w/case (15)
9. Clipboard (20)
10. Compass, land measuring (C-thru) (20)
11. Compass (Silva ranger type 15) w/case, quadrant (15) and azimuth (15)
12. Compass, surveying (4)
13. Computer w/multimedia kit and modem (10)
14. Engineering scales w/48 scales (20)
15. Field data recorder (IBM) w/ interface, software, changer and carrying case (4)
16. Fire weather instrument kit (5)
17. Fire rake (5)
18. Fire swatter (5)
19. First aid kit (1)
20. Glasses, safety (20)
21. Global positioning system (Promark X.) w/extension antenna kit, range pole/ bipod, and case (2)
22. Gun, tree marking (10)
23. Hat, safety hard (20)
24. Hoedad (10)
25. Hypo-hatchet tree injector (5)
26. Increment borer (10)
27. Leggings, zip-up (20)
28. Machete w/leather sheath (10)
29. Orienteering package (20)
30. Pole, range (4)
31. Printer, dot matrix (4)
32. Printer, laser (1)
33. Probe, soil (2)
34. Pump, backpack fire fighting (5)
35. Relaskop (American scale) w/light, Jacob staff, and leather case (5)
36. Rod, telescoping leveling (1)
37. Rule, log (20)
38. Scale, triangle engineer (20)
39. Sheet holder/clip board (aluminum) (20)

40. Sprayer, backpack w/ low-pressure gunjet (5)
41. Station, electronic total w/ tripod, on-board battery, case, and prism set (1)
42. Stereoscope (10)
43. Talley book (10)
44. Tape, logger (10)
45. Tape, surveying (4)
46. Tape, diameter (20)
47. Torch, drip (5)
48. Tree scale stick (20)
49. Vest, cruiser (20)
50. Water cooler, 5 gal w/cup dispenser (1)
51. Wedge prism (10 BAF) (20)

RECOMMENDED INSTRUCTIONAL AIDS

1. Agricultural Satellite Information System (ASIS) (1)
2. Camcorder w/tripod and carrying case (1)
3. Camera, 35mm w/zoom lens (1)
4. Cart, AV (for TV-VCR) (1)
5. Cart, AV (for overhead projector) (1)
6. Compass, demonstration (1)
7. Contour kit (1)
8. Overhead projector
9. Phone service (for Internet connection) (1)
10. Slide projector (1)
11. TV-VCR (1)
12. Video out (Microcomputer to TV monitor)

APPENDIX A:

RELATED ACADEMIC TOPICS

APPENDIX A

RELATED ACADEMIC TOPICS FOR COMMUNICATIONS

C1 Interpret written material.
C2 Interpret visual materials (maps, charts, graphs, tables, etc.).
C3 Listen, comprehend, and take appropriate actions.
C4 Access, organize, and evaluate information.
C5 Use written and/or oral language skills to work cooperatively to solve problems, make decisions, take actions, and reach agreement.
C6 Communicate ideas and information effectively using various oral and written forms for a variety of audiences and purposes.

EXPANDED TOPICS FOR COMMUNICATIONS

TOPIC C1: Interpret written material.

C1.01 Read and follow complex written directions.
C1.02 Recognize common words and meanings associated with a variety of occupations.
C1.03 Adjust reading strategy to purpose and type of reading.
C1.04 Use sections of books and reference sources to obtain information.
C1.05 Compare information from multiple sources and check validity.
C1.06 Interpret items and abbreviations used in multiple forms.
C1.07 Interpret short notes, memos, and letters.
C1.08 Comprehend technical words and concepts.
C1.09 Use various reading techniques depending on purpose for reading.
C1.10 Find, read, understand, and use information from printed matter or electronic sources.

TOPIC C2: Interpret visual materials (maps, charts, graphs, tables, etc.).

C2.01 Use visuals in written and in oral presentations.
C2.02 Recognize visual cues to meaning (layout, typography, etc.).
C2.03 Interpret and apply information using visual materials.

TOPIC C3: Listen, comprehend, and take appropriate action.

C3.01 Identify and evaluate orally-presented messages according to purpose.
C3.02 Recognize barriers to effective listening.
C3.03 Recognize how voice inflection changes meaning.
C3.04 Identify speaker signals requiring a response and respond accordingly.
C3.05 Listen attentively and take accurate notes.
C3.06 Use telephone to receive information.

C3.07 Analyze and distinguish information from formal and informal oral presentations.

TOPIC C4: Access, organize, and evaluate information.

C4.01 Distinguish fact from opinion.
C4.02 Use various print and non-print sources for specialized information.
C4.03 Interpret and distinguish between literal and figurative meaning.
C4.04 Interpret written or oral communication in relation to context and writer's point of view.
C4.05 Use relevant sources to gather information for written or oral communication.

TOPIC C5: Use written and/or oral language skills to work cooperatively to solve problems, make decisions, take actions, and reach agreement.

C5.01 Select appropriate words for communication needs.
C5.02 Use reading, writing, listening, and speaking skills to solve problems.
C5.03 Compose inquiries and requests.
C5.04 Write persuasive letters and memos.
C5.05 Edit written reports, letters, memos, and short notes for clarity, correct grammar, and effective sentences.
C5.06 Write logical and understandable statements, phrases, or sentences for filling out forms, for correspondence or reports.
C5.07 Write directions or summaries of processes, mechanisms, events, or concepts.
C5.08 Select and use appropriate formats for presenting reports.
C5.09 Convey information to audiences in writing.
C5.10 Compose technical reports and correspondence that meet accepted standards for written communications.

TOPIC C6: Communicate ideas and information using oral and written forms for a variety of audiences and purposes.

C6.01 Give complex oral instructions.
C6.02 Describe a business or industrial process/mechanism.
C6.03 Participate effectively in group discussions and decision making.
C6.04 Produce effective oral messages utilizing different media.
C6.05 Explore ideas orally with partners.
C6.06 Participate in conversations by volunteering information when appropriate and asking relevant questions when appropriate.
C6.07 Restate or paraphrase a conversation to confirm one's own understanding.
C6.08 Gather and provide information utilizing different media.

C6.09 Prepare and deliver persuasive, descriptive, and demonstrative oral presentations.

RELATED ACADEMIC TOPICS FOR MATHEMATICS

M1 Relate number relationships, number systems, and number theory.
M2 Explore patterns and functions.
M3 Explore algebraic concepts and processes.
M4 Explore the concepts of measurement.
M5 Explore the geometry of one-, two-, and three-dimensions.
M6 Explore concepts of statistics and probability in real world situations.
M7 Apply mathematical methods, concepts, and properties to solve a variety of real-world problems.

EXPANDED TOPICS FOR MATHEMATICS

TOPIC M1: Relate number relationships, number systems, and number theory.

M1.01 Understand, represent, and use numbers in a variety of equivalent forms (integer, fraction, decimal, percent, exponential, and scientific notation) in real world and mathematical problem situations.
M1.02 Develop number sense for whole numbers, fractions, decimals, integers, and rational numbers.
M1.03 Understand and apply ratios, proportions, and percents in a wide variety of situations.
M1.04 Investigate relationships among fractions, decimals, and percents.
M1.05 Compute with whole numbers, fractions, decimals, integers, and rational numbers.
M1.06 Develop, analyze, and explain procedures for computation and techniques for estimations.
M1.07 Select and use an appropriate method for computing from among mental arithmetic, paper-and-pencil, calculator, and computer methods.
M1.08 Use computation, estimation, and proportions to solve problems.
M1.09 Use estimation to check the reasonableness of results.

TOPIC M2: Explore patterns and functions.

M2.01 Describe, extend, analyze, and create a wide variety of patterns.
M2.02 Describe and represent relationships with tables, graphs, and rules.
M2.03 Analyze functional relationships to explain how a change in one quantity results in a change in another.
M2.04 Use patterns and functions to represent and solve problems.
M2.05 Explore problems and describe results using graphical, numerical, physical, algebraic, and verbal mathematical models or representations.

M2.06 Use a mathematical idea to further their understanding of other mathematical ideas.
M2.07 Apply mathematical thinking and modeling to solve problems that arise in other disciplines, such as art, music, and business.

TOPIC M3: Explore algebraic concepts and processes.

M3.01 Represent situations and explore the interrelationships of number patterns with tables, graphs, verbal rules, and equations.
M3.02 Analyze tables and graphs to identify properties and relationships and to interpret expressions and equations.
M3.03 Apply algebraic methods to solve a variety of real world and mathematical problems.

TOPIC M4: Explore the concepts of measurement.

M4.01 Estimate, make, and use measurements to describe and compare phenomena.
M4.02 Select appropriate units and tools to measure to the degree of accuracy required in a particular situation.
M4.03 Extend understanding of the concepts of perimeter, area, volume, angle measure, capacity, and weight and mass.
M4.04 Understand and apply reasoning processes, with special attention to spatial reasoning and reasoning with proportions and graphs.

TOPIC M5: Explore the geometry of one-, two-, and three-dimensions.

M5.01 Identify, describe, compare, and classify geometric figures.
M5.02 Visualize and represent geometric figures with special attention to developing spatial sense.
M5.03 Explore transformations of geometric figures.
M5.04 Understand and apply geometric properties and relationships.
M5.05 Classify figures in terms of congruence and similarity and apply these relationships.

TOPIC M6: Explore the concepts of statistics and probability in real world situations.

M6.01 Systematically collect, organize, and describe data.
M6.02 Construct, read, and interpret tables, charts, and graphs.
M6.03 Develop an appreciation for statistical methods as powerful means for decision making.
M6.04 Make predictions that are based on exponential or theoretical probabilities.

M6.05 Develop an appreciation for the pervasive use of probability in the real world.

TOPIC M7: Apply mathematical methods, concepts, and properties to solve a variety of real-world problems.

M7.01 Use computers and/or calculators to process information for all mathematical situations.
M7.02 Use problem-solving approaches to investigate and understand mathematical content.
M7.03 Formulate problems from situations within and outside mathematics.
M7.04 Generalize solutions and strategies to new problem situations.

RELATED ACADEMIC TOPICS FOR SCIENCE

S1 Explain the Anatomy and Physiology of the human body.
S2 Apply the basic biological principles of Plants, Viruses and Monerans, Algae, Protista, and Fungi.
S3 Relate the nine major phyla of the kingdom animalia according to morphology, anatomy, and physiology.
S4 Explore the chemical and physical properties of the earth to include Geology, Meteorology, Oceanography, and the Hydrologic Cycle.
S5 Investigate the properties and reactions of matter to include symbols, formulas and nomenclature, chemical equations, gas laws, chemical bonding, acid-base reactions, equilibrium, oxidation-reduction, nuclear chemistry, and organic chemistry.
S6 Explore the principles and theories related to motion, mechanics, electricity, magnetism, light energy, thermal energy, wave energy, and nuclear physics.
S7 Explore the principles of genetic and molecular Biology to include the relationship between traits and patterns of inheritance, population genetics, the structure and function of DNA, and current applications of DNA technology.
S8 Apply concepts related to the scientific process and method to include safety procedures for classroom and laboratory; use and care of scientific equipment; interrelationships between science, technology and society; and effective communication of scientific results in oral, written, and graphic form.

EXPANDED TOPICS FOR SCIENCE

TOPIC S1: Explain the Anatomy and Physiology of the human body.

S1.01 Recognize common terminology and meanings.
S1.02 Explore the relationship of the cell to more complex systems within the body.

S1.03 Summarize the functional anatomy of all the major body systems.
S1.04 Relate the physiology of the major body systems to its corresponding anatomy.
S1.05 Compare and contrast disease transmission and treatment within each organ system.
S1.06 Explore the usage of medical technology as related to human organs and organ systems.
S1.07 Explain the chemical composition of body tissue.

TOPIC S2: Apply the basic biological principles of Plants, Viruses and Monerans, Algae, Protista, and Fungi.

S2.01 Identify the major types and structures of plants, viruses, monera, algae protista, and fungi.
S2.02 Explain sexual and asexual reproduction.
S2.03 Describe the ecological importance of plants as related to the environment.
S2.04 Analyze the physical chemical and behavioral process of a plant.

TOPIC S3: Relate the nine major phyla of the kingdom animalia according to morphology, anatomy, and physiology.

S3.01 Explain the morphology, anatomy, and physiology of animals.
S3.02 Describe the characteristics, behaviors, and habitats of selected animals.

TOPIC S4: Explore the chemical and physical properties of the earth to include Geology, Meteorology, Oceanography, and the Hydrologic Cycle.

S4.01 Examine minerals and their identification, products of the rock cycle, byproducts of weathering, and the effects of erosion.
S4.02 Relate the Hydrologic Cycle to include groundwater its zones, movement, and composition; surface water systems, deposits, and runoff.
S4.03 Consider the effects of weather and climate on the environment.
S4.04 Examine the composition of seawater; wave, tides, and currents; organisms, environment, and production of food; energy, food and mineral resources of the oceans.

TOPIC S5: Investigate the properties and reactions of matter to include symbols, formulas and nomenclature, chemical equations, gas laws, chemical bonding, acid-base reactions, equilibrium, oxidation-reduction, nuclear chemistry, and organic chemistry.

S5.01 Examine the science of chemistry to include the nature of matter, symbols, formulas and nomenclature, and chemical equations.

S5.02 Identify chemical reactions including precipitation, acids-bases, and reduction-oxidation.
S5.03 Explore the fundamentals of chemical bonding and principles of equilibrium.
S5.04 Relate the behavior of gases.
S5.05 Investigate the structure, reactions, and uses of organic compounds; and investigate nuclear chemistry and radiochemistry.

TOPIC S6: Explore the principles and theories related to motion, mechanics, electricity, magnetism, light energy, thermal energy, wave energy, and nuclear physics.

S6.01 Examine fundamentals of motion of physical bodies and physical dynamics.
S6.02 Explore the concepts and relationships among work, power, and energy.
S6.03 Explore principles, characteristics, and properties of electricity, magnetism, light energy, thermal energy, and wave energy.
S6.04 Identify principles of modern physics related to nuclear physics.

TOPIC S7: Explore the principles of genetic and molecular Biology to include the relationship between traits and patterns of inheritance; population genetics, the structure and function of DNA, and current applications of DNA technology.

S7.01 Examine principles, techniques, and patterns of traits and inheritance in organisms.
S7.02 Apply the concept of population genetics to both microbial and multicellular organism.
S7.03 Identify the structure and function of DNA and the uses of DNA technology in science, industry, and society.

TOPIC S8: Apply concepts related to the scientific process and method to include safety procedures for classroom and laboratory; use and care of scientific equipment; interrelationships between science, technology and society; and effective communication of scientific results in oral, written, and graphic form.

S8.01 Apply the components of scientific processes and methods in classroom and laboratory investigations.
S8.02 Observe and practice safe procedures in the classroom and laboratory.
S8.03 Demonstrate proper use and care for scientific equipment.
S8.04 Investigate science careers, and advances in technology.
S8.05 Communicate results of scientific investigations in oral, written, and graphic form.

APPENDIX B:

WORKPLACE SKILLS

APPENDIX B
WORKPLACE SKILLS FOR THE 21ST CENTURY

WP1 Allocates resources (time, money, materials and facilities, and human resources).

WP2 Acquires, evaluates, organizes and maintains, and interprets/communicates information, including the use of computers.

WP3 Practices interpersonal skills related to careers including team member participation, teaching other people, serving clients/customers, exercising leadership, negotiation, and working with culturally diverse.

WP4 Applies systems concept including basic understanding, monitoring and correction system performance, and designing and improving systems.

WP5 Selects, applies, and maintains/troubleshoots technology.

WP6 Employs thinking skills including creative thinking, decision making, problem solving, reasoning, and knowing how to learn.

APPENDIX C:

STUDENT COMPETENCY PROFILE

STUDENT COMPETENCY PROFILE
FOR FORESTRY I

Student: _____

This record is intended to serve as a method of noting student achievement of the competencies in each course. It can be duplicated for each student and serve as a cumulative record of competencies achieved in the program.

In the blank before each competency, place the date on which the student mastered the competency.

Unit 1: Exploring the World of Forestry

_____ 1. Explain the importance of forestry.
_____ 2. Explain careers in the field of forestry.
_____ 3. Explain the impact of federal and state regulations in forestry operations.

Unit 2: Leadership/FFA Activities

_____ 1. Explain the benefits of FFA participation.
_____ 2. Demonstrate group leadership skills.

Unit 3: Forest Safety

_____ 1. Explain forest safety practices.

Unit 4: Tree Growth and Stand Development

_____ 1. Explain tree physiology.
_____ 2. Explain forest stand development.
_____ 3. Explain applications of tissue culture, cloning, and other advances in biotechnology to forestry.

Unit 5: Dendrology

_____ 1. Explain the tree classification system.

Unit 6: Forest Surveying and Mapping

_____ 1. Explain concepts of forest surveying.
_____ 2. Perform forestry surveying and mapping techniques.

Unit 7: Legal Land Description

_____ 1. Explain the legal land description system used in Mississippi.
_____ 2. Apply principles of legal land description.

Unit 8: Tree and Log Measurements

_____ 1. Explain tree measurement techniques.
_____ 2. Perform volume measurement of standing timber.
_____ 3. Perform volume measurement of sawlogs.

Unit 9: Introduction to Timber Cruising

_____ 1. Apply procedures for cruising timber.
_____ 2. Perform timber cruising.

STUDENT COMPETENCY PROFILE
FOR FORESTRY II

Student: _____

This record is intended to serve as a method of noting student achievement of the competencies in each course. It can be duplicated for each student and serve as a cumulative record of competencies achieved in the program.

In the blank before each competency, place the date on which the student mastered the competency.

Unit 1: Identify Forests and Forest Products

_____ 1. Apply procedures to identify forest types.
_____ 2. Apply procedures to identify the physical properties of wood.

Unit 2: Employability Skills/FFA Activities

_____ 1. Develop employability skills.
_____ 2. Participate in FFA leadership activities associated with forestry.

Unit 3: Forest Management Practices

_____ 1. Explain forest management practices.
_____ 2. Perform forest management practices.

Unit 4: Advanced Timber Cruising

_____ 1. Plan and conduct a timber cruise.

Unit 5: Timber Marketing

_____ 1. Explain timber marketing procedures.

Unit 6: Timber Harvesting

_____ 1. Explain timber harvesting procedures.

Unit 7: Reforestation

_____ 1. Explain reforestation practices.
_____ 2. Perform reforestation practices.

Unit 8: Forest Fire Management

_____ 1. Explain forest fire management practices.
_____ 2. Apply forest fire management techniques.

Unit 9: Forest Insects and Disease

_____ 1. Apply forest insect and disease control.